DOCUMENT RESUME

ED 338 880 CE 059 591

AUTHOR Upchurch, Richard
TITLE Aviation Pilot Training I. Task Analyses: Semester II. Field Review Copy.
INSTITUTION Henrico County Public Schools, Glen Allen, VA. Virginia Vocational Curriculum Center.
SPONS AGENCY Virginia State Dept. of Education, Richmond. Div. of Vocational and Adult Education.
PUB DATE 90
NOTE 117p.; For related guides, see CE 059 589-593. Cover title varies slightly.
PUB TYPE Guides - Classroom Use - Teaching Guides (For Teacher) (052)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS *Aircraft Pilots; *Aviation Education; *Aviation Technology; *Behavioral Objectives; Competency Based Education; Course Descriptions; Criterion Referenced Tests; Federal Regulation; Learning Activities; *Meteorology; Navigation; Radio; Safety; Secondary Education; Task Analysis; Weather

ABSTRACT

This guide for aviation pilot training begins with a course description, resource information, and a course outline. Tasks/competencies are categorized into 12 concept/duty areas: understanding safe procedures in the flight environment; understanding safe procedures in the airport environment; understanding Federal Aviation Regulations concerning controlled, uncontrolled, and special use airspace; understanding the use of aircraft radio communications; understanding basic procedures for preflight, start, and taxi for a typical light aircraft; understanding the effect of weather on flight performance; interpreting written weather data; interpreting graphic weather data; understanding basic navigational charts; operating the slide graphic computer; and understanding three basic navigational methods. Four to nine tasks are listed for each concept/duty. A performance objective, criterion-referenced measure, and enabling objective are provided for each task/competency. At the end of each concept/duty category, resources are listed by task. The final assignment calls for passing the Federal Aviation Administration's Private Pilot Written Tests. (YLB)

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# Aviation Pilot Training

## Task Analyses
## Year I/Semester II

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1990

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# AVIATION PILOT TRAINING I

## TASK ANALYSES

### Semester II

Prepared by

Colonel Richard Upchurch, USMC (Ret)
Aviation Programs Supervisor
Vocational and Community Education
Henrico County Public Schools

in cooperation with

Virginia Vocational Curriculum and Resource Center

1990

## PREFACE

The task analyses for Aviation Pilot Training I and II and Aviation Technician I and the flight syllabus were prepared by Colonel Richard Upchurch, USMC (Retired), Aviation Programs Supervisor for Henrico County Public Schools.

The curriculum will be field tested in the aviation programs at the Highland Springs Technical Center during the 1990-91 school year.

The guides were prepared for publication by the Virginia Vocational Curriculum and Resource Center, Vocational and Community Education, Henrico County Public Schools.

Dewey T. Oakley Jr., Director
Vocational and Community Education

Peggy Watson, Director
Virginia Vocational Curriculum and
Resource Center

Phil R. Phelps, Writer/Editor
Virginia Vocational Curriculum and
Resource Center

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Certified Flight Instructor and
Technical Instructor
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Ms. Betty Harris
Certified Flight Instructor
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Highland Springs Technical Center
Henrico County Public Schools

Col. R. L. Upchurch, USMC (Ret)
Aviation Programs Supervisor
Highland Springs Technical Center
Henrico County Public Schools

## COURSE DESCRIPTION AND RESOURCE INFORMATION

**Course Description: Aviation Pilot Training I (Semester II)**

This course provides concentrated study of material required to pass the Federal Aviation Administration Private Pilot written test. This test is administered as the students' final assignment at the conclusion of the semester. Emphasized subject areas include meteorology, navigation, Federal Aviation Regulations (FARs), flight and airport environments, and aircraft communication. Students become familiar with the cockpit environment by using the GAT-1 flight simulator and receive up to five instructional flights in a light aircraft. Flights are conducted and graded by the Certified Flight Instructor (CFI) as part of the *Flight Syllabus*.

**Resources:**

**Text:**

*Aviation Fundamentals*. 2nd ed. Englewood, Colorado: Jeppesen Sanderson, 1989.

**Audiovisuals:**

Jeppesen Sanderson transparencies may be ordered from Jeppesen Sanderson, Inc., Englewood, Colorado.

Federal Aviation Administration films and videotapes may be acquired through the Virginia Department of Aviation.

**Equipment and Material:**

Static aircraft: Beech "Sundowner" (nonflyable)
GAT-1 full motion light aircraft simulator
ATC 610 instrument panel simulator with engine and flight controls
Assorted aircraft parts, instruments, radios, and other components from aircraft salvage units and Federal Surplus
Aeronautical charts, diagrams, photographs, and other documents acquired from military and civilian aviation agencies in the Richmond area
Light aircraft at local airports
CSG flight computers
E6B flight computer mockup
Plastic and plexiglass navigation computers
VHS radios and frequency scanners
*Private Pilot Question Book* (FAA)

## COURSE OUTLINE

### Aviation Pilot Training I (Semester II)

| CONTENT | TASK NUMBER |
|---|---|
| I. SAFETY IN FLIGHT | |
| A. Scanning technique | 1.1 |
| B. Procedures for training area | 1.2 |
| C. Right-of-way | 1.3 |
| D. Minimum safe and cruising altitudes | 1.4 |
| II. SAFETY AT AIRPORTS | |
| A. Runway/taxiway layout | 2.1 |
| B. Runway/taxiway markings | 2.2 |
| C. Wind direction and velocity | 2.3 |
| D. Segmented circle/wind indicator | 2.4 |
| E. Ramp area | 2.5 |
| F. Noise abatement | 2.6 |
| G. Visual slope indicator systems | 2.7 |
| H. Lighting systems | 2.8 |
| III. USE OF AIRSPACE | |
| A. Controlled and uncontrolled airspace | 3.1 |
| B. Six divisions of controlled airspace | 3.2 |
| C. Function of Air Traffic Control | 3.3 |
| D. Transponder | 3.4 |
| E. Visibility and distance from clouds in controlled airspace | 3.5 |
| F. Federal airways | 3.6 |
| G. Visibility and distance from clouds in uncontrolled airspace | 3.7 |
| H. Five divisions of special use airspace | 3.8 |
| I. Notice to Airman (NOTAM) | 3.9 |
| IV. AIRCRAFT RADIO COMMUNICATIONS | |
| A. VHF radio: capabilities and limitations | 4.1 |
| B. VHF radio: tuning | 4.2 |
| C. Clear and concise speech | 4.3 |
| D. CTAF, UNICOM, and MULTICOM | 4.4 |
| E. Traffic advisory communications | 4.5 |
| F. Flight service stations (FSS) | 4.6 |

## COURSE OU LINE (continued)

| CONTENT | TASK NUMBER |
|---|---|
| V. PREFLIGHT, START, AND TAX | |
| A. Pilot's logbook | 5.1 |
| B. Aircraft documents | 5.2 |
| C. Servicing and preflighting | 5.3 |
| D. Checklists | 5.4 |
| E. Starting the aircraft | 5.5 |
| F. Taxiing | 5.6 |
| VI. TAKEOFF AND LANDING | |
| A. Pretakeoff checklist | 6.1 |
| B. Procedures for takeoff | 6.2 |
| C. Straight and level flight, shall w turns, descents, and climbs | 6.3 |
| D. Entering the landing pattern | 6.4 |
| E. Landing pattern | 6.5 |
| F. Taxiing and securing the aircr ft | 6.6 |
| VII. EFFECT OF WEATHER ON FLI HT | |
| A. Composition of the atmosphere | 7.1 |
| B. Creation of global wind patter | 7.2 |
| C. Effect of local geographical fea ires | 7.3 |
| D. Meteorological terms | 7.4 |
| E. Temperature, moisture, and ai stability | 7.5 |
| F. The three families of clouds | 7.6 |
| G. Four air mass boundaries | 7.7 |
| H. Thunderstorms | 7.8 |
| I. Radiation and advection | 7.9 |
| VIII. WRITTEN WEATHER DATA | |
| A. Elements on a surface aviatior veather report | 8.1 |
| B. Coded data on a surface aviati weather report | 8.2 |
| C. Radar weather report (RAREP | 8.3 |
| D. Terminal weather forecast (FT | 8.4 |
| E. Area forecast (FA) | 8.5 |
| F. Winds and temperatures aloft recast | 8.6 |
| G. Severe weather watch bulletin WW) | 8.7 |

## COURSE OUTLINE (continued)

| CONTENT | TASK NUMBER |
|---|---|
| IX. GRAPHIC WEATHER DATA | |
| A. Surface analysis chart | 9.1 |
| B. Weather depiction chart | 9.2 |
| C. Radar summary chart | 9.3 |
| D. Low-level significant weather prognosis | 9.4 |
| E. Preflight weather briefing | 9.5 |
| X. BASIC NAVIGATIONAL CHARTS | |
| A. Sectional charts and world aeronautical charts (WACs) | 10.1 |
| B. Longitude and latitude | 10.2 |
| C. Geographical features | 10.3 |
| D. Man-made features and navigational aids | 10.4 |
| XI. USE OF SLIDE GRAPHIC COMPUTER | |
| A. Basic functions | 11.1 |
| B. Time-distance application | 11.2 |
| C. Fuel consumption application | 11.3 |
| D. Endurance application | 11.4 |
| E. Range application | 11.5 |
| F. Airspeed application | 11.6 |
| G. Density altitude application | 11.7 |
| H. Wind-heading-groundspeed application | 11.8 |
| I. Conversion applications | 11.9 |
| XII. BASIC NAVIGATIONAL METHODS | |
| A. Plotting the course | 12.1 |
| B. Pilotage method | 12.2 |
| C. Dead reckoning method | 12.3 |
| D. Navigation log | 12.4 |
| E. VFR flight plan | 12.5 |
| F VFR position reports to Air Traffic Control | 12.6 |
| G. VOR, DME, and ADF | 12.7 |
| FINAL ASSIGNMENT: FAA PRIVATE PILOT WRITTEN TEST | |

# CONCEPT/DUTY AREAS

1. UNDERSTANDING SAFE PROCEDURES IN THE FLIGHT ENVIRONMENT
2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT
3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARS) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE
4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMUNICATIONS
5. UNDERSTANDING BASIC PROCEDURES FOR PREFLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT
6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT
7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE
8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA
9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA
10. UNDERSTANDING BASIC NAVIGATIONAL CHARTS
11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER
12. UNDERSTANDING THREE BASIC NAVIGATIONAL METHODS
13. PASSING THE FAA PRIVATE PILOT WRITTEN TEST

## CONCEPT/DUTY AREA

1. UNDERSTANDING SAFE PROCEDURES IN THE FLIGHT ENVIRONMENT

---

## TASKS/COMPETENCIES

1.1 Describe proper scanning technique.

1.2 Describe proper procedures for operating in a training area.

1.3 Explain the Federal Aviation Regulations concerning right-of-way.

1.4 Explain Federal Aviation Regulations concerning minimum safe and cruising altitudes.

---

## CONCEPT/DUTY AREA

1. UNDERSTANDING SAFE PROCEDURES IN THE FLIGHT ENVIRONMENT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

1.1 Describe proper scanning technique.

## PERFORMANCE OBJECTIVE

P1.1 Given access to the cockpit of the GAT-1 simulator, describe with 85% accuracy the proper scanning technique and how it enhances the sighting of aircraft and overcomes empty field myopia and blind spots.

## CRITERION-REFERENCED MEASURE

C1.1 Demonstration, 85% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students practice alternating a scan between the surrounding horizon and the cockpit instruments while sitting in the simulator.
2. Use the JS video *The Flight Environment* to explain the procedures a pilot follows while airborne.

## CONCEPT/DUTY AREA

1. UNDERSTANDING SAFE PROCEDURES IN THE FLIGHT ENVIRONMENT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

1.2 Describe proper procedures for operating in a training area.

## PERFORMANCE OBJECTIVE

P1.2 Given a model aircraft, explain with 75% accuracy the proper procedures for clearing an area prior to entering training maneuvers.

## CRITERION-REFERENCED MEASURE

C1.2 Demonstration, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use FAA video *Midair Collision Avoidance* to demonstrate the importance of clearing an area before doing maneuvers.
2. Review history of aircraft accidents that resulted from not properly clearing an area prior to entering training maneuvers.

## CONCEPT/DUTY AREA

1. UNDERSTANDING SAFE PROCEDURES IN THE FLIGHT ENVIRONMENT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

1.3 Explain the Federal Aviation Regulations concerning right-of-way.

## PERFORMANCE OBJECTIVE

P1.3 Given two model aircraft, explain with 80% accuracy how pilots follow the Federal Aviation Regulations (FARs) concerning right-of-way.

## CRITERION-REFERENCED MEASURE

C1.3 Demonstration, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Divide class into pairs, and have them assume different positions in relation to each other before the class. Have classmates indicate which one of the pair has the right-of-way.

## CONCEPT/DUTY AREA

1. UNDERSTANDING SAFE PROCEDURES IN THE FLIGHT ENVIRONMENT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

1.4 Explain Federal Aviation Regulations concerning minimum safe and cruising altitudes.

## PERFORMANCE OBJECTIVE

P1.4 Given ten compass headings and obstacles enroute, indicate with 80% accuracy the proper minimum safe and cruising altitudes for each.

## CRITERION-REFERENCED MEASURE

C1.4 Written test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Assign a variety of compass headings, and list obstacles with their elevation along the route. Divide class into pairs, and have them recommend appropriate cruising altitudes for each leg of the flight.

# RESOURCES

## TASK 1.1

| | |
|---|---|
| Equipment and Material: | GAT-1 simulator |
| Audiovisuals: | *The Flight Environment* (videotape). Jeppesen Sanderson. |

## TASK 1.2

| | |
|---|---|
| Equipment and Material: | Model aircraft |
| Audiovisuals: | *Midair Collision Avoidance* (videotape). FAA. |

## TASK 1.3

| | |
|---|---|
| Equipment and Material: | Model aircraft |
| Reference: | Federal Aviation Regulations. FAA. |

## CONCEPT/DUTY AREA

2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT

---

## TASKS/COMPETENCIES

2.1 Identify the runway/taxiway layout of a typical airport.

2.2 Explain the runway and taxiway markings at a typical airport.

2.3 Explain the methods to determine wind direction and velocity at an airport.

2.4 Explain the purpose of the segmented circle/wind indicator found at some uncontrolled airports.

2.5 Identify the proper procedures for operating an aircraft in the ramp area.

2.6 Describe acceptable methods for practicing noise abatement.

2.7 Explain the visual slope indicator system (VASI).

2.8 Identify normal lighting systems at airports.

---

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

2.1 Identify the runway/taxiway layout of a typical airport.

## PERFORMANCE OBJECTIVE

P2.1 Given a diagram of a typical municipal airport, identify with 80% accuracy the runways, runway threshold, taxiways, ramp areas, and holding areas.

## CRITERION-REFERENCED MEASURE

C2.1 Completed diagram, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Divide class into pairs. Have them look at photographs of airports in magazines and identify all recognizable features.
2. Review FAA airport plates, and identify airport features.
3. Examine schematics of Chesterfield Airport, New Kent Airport, Hanover Airport, and Richmond International Airport, and identify all airport features.
4. Use the FAA video *Danville Regional Airport* to illustrate the features of a typical airport.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

2.2 Explain the runway and taxiway markings at a typical airport.

## PERFORMANCE OBJECTIVE

P2.2 Given a diagram of a typical airport, explain with 80% accuracy the functions of the runway threshold markings, displaced threshold markings, taxiway hold lines, unusable runway markings, runway numerals, and runway centerline.

## CRITERION-REFERENCED MEASURE

C2.2 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review diagrams of airports in airport publications, and identify the various markings shown.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

2.3 Explain the methods to determine wind direction and velocity at an airport.

## PERFORMANCE OBJECTIVE

P2.3 Given a wind sock, wind "T", and tetrahedron, explain with 80% accuracy how each provides wind direction and velocity and two identifiable features of each.

## CRITERION-REFERENCED MEASURE

C2.3 Demonstration, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Visit a local general airport, and observe the airfield markings and wind direction indicators.

2. Give students diagrams of an airport with wind direction indicators. On the chalkboard, show the wind indicator position. Have students determine wind direction and velocity and recommend an appropriate active runway.

## CONCEPT/DUTY AREA

2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

2.4 Explain the purpose of the segmented circle/wind indicator found at some uncontrolled airports.

## PERFORMANCE OBJECTIVE

P2.4 Given five positions of the segmented circle/wind indicator, explain with 80% accuracy the wind direction and airport traffic pattern for each position shown.

## CRITERION-REFERENCED MEASURE

C2.4 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Provide students with a diagram of an airport with runways and various obstacles. Draw various positions of the segmented circle on the chalkboard. Have students determine the airport traffic pattern.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

2.5 Identify the proper procedures for operating an aircraft in the ramp area.

## PERFORMANCE OBJECTIVE

P2.5 Given a diagram of a typical airport ramp area, list with 80% accuracy five areas of concern for a pilot when taxiing or parking the aircraft.

## CRITERION-REFERENCED MEASURE

C2.5 Completed list, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Practice the appropriate knots for securing an airplane with rope on an airfield ramp.
2. Use the chalkboard to illustrate the hazards in a ramp area.

## CONCEPT/DUTY AREA

2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

2.6 Describe acceptable methods for practicing noise abatement.

## PERFORMANCE OBJECTIVE

P2.6 Given a diagram of an airport, describe with 80% accuracy two methods to reduce aircraft noise over any specified area in the vicinity of the airport and two methods to determine before arrival that an airfield practices noise abatement procedures.

## CRITERION-REFERENCED MEASURE

C2.6 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Distribute FAA *Enroute Supplement* to students. Have them determine and discuss airports and procedures where noise abatement is practiced.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

2.7 Explain the visual slope indicator system (VASI).

## PERFORMANCE OBJECTIVE

P2.7 Given a glide slope indication on each of the four VASI systems, describe with 75% accuracy the flight path of the aircraft receiving each of the indications.

## CRITERION-REFERENCED MEASURE

C2.7 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Provide glide slope indications for each of the four VASI systems, and have students determine the flight path and give the corrective action the pilot would take.
2. Use FAA film *Takeoffs and Landings* to illustrate the operation of the VASI system.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 2. UNDERSTANDING SAFE PROCEDURES IN THE AIRPORT ENVIRONMENT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

2.8 Identify normal lighting systems at airports.

## PERFORMANCE OBJECTIVE

P2.8 Given a diagram of a typical municipal airport, identify with 80% accuracy each of the lighting systems shown.

## CRITERION-REFERENCED MEASURE

C2.8 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review airport diagrams, and identify various lighting systems shown.
2. Compare the lighting systems at Hanover, Chesterfield, New Kent, and Richmond airports.

# RESOURCES

**TASK 2.1**

Equipment and Material:
- Airport diagrams
- Photographs of airports
- Schematics of local airports

Audiovisuals:
- *Danville Regional Airport* (videotape). FAA.

**TASK 2.2**

Equipment and Material:
- Airport diagrams
- Airport publications

**TASK 2.3**

Equipment and Material:
- Wind sock
- Wind "T"
- Tetrahedron
- Airport diagrams

**TASK 2.4**

Equipment and Material
- Airport diagrams

**TASK 2.5**

Equipment and Material:
- Airport diagrams
- Rope

**TASK 2.6**

Equipment and Material:
- Airport diagrams

Reference:
- *Enroute Supplement*. FAA.

**TASK 2.7**

Audiovisuals:
- *Takeoffs and Landings* (film). FAA.

**TASK 2.8**

Equipment and Material:
- Airport diagrams

## CONCEPT/DUTY AREA

3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE

---

## TASKS/COMPETENCIES

3.1 Explain the difference between controlled and uncontrolled airspace.

3.2 Describe the six divisions of controlled airspace.

3.3 Explain the function of Air Traffic Control (ATC) in both visual (VFR) and instrument (IFR) environments.

3.4 Demonstrate use of a transponder, and explain its function.

3.5 Explain the Federal Aviation Regulations (FARs) concerning visibility and distance from clouds when operating visually in controlled airspace.

3.6 Describe the dimensions, altitude limits, and restrictions for the federal airways.

3.7 Explain the Federal Aviation Regulations (FARs) concerning visibility and distance from clouds when operating visually in uncontrolled airspace.

3.8 Explain the Federal Aviation Regulations (FARs) concerning each of the five divisions of special use airspace.

3.9 Explain the purpose of a Notice to Airman (NOTAM) and how pilots check for NOTAMs prior to a flight.

---

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.1 Explain the difference between controlled and uncontrolled airspace.

## PERFORMANCE OBJECTIVE

P3.1 Given an aeronautical sectional chart with 10 designated areas marked, identify with 80% accuracy which areas are controlled and which are uncontrolled, and explain the reason for each designation.

## CRITERION-REFERENCED MEASURE

C3.1 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review various sectional charts, and identify all controlled areas.
2. Review an enroute low altitude flight information publication (FLIP), and identify controlled and uncontrolled air space.
3. Review FARs concerning controlled and uncontrolled airspace.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.2 Describe the six divisions of controlled airspace.

## PERFORMANCE OBJECTIVE

P3.2 Given information and class discussion, describe with 75% accuracy each of the six divisions of controlled airspace.

## CRITERION-REFERENCED MEASURE

C3.2 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review sectional charts, and identify the various categories of controlled airspace.
2. Review enroute low altitude FLIPs, and identify the various categories of controlled airspace.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.3 Explain the function of Air Traffic Control (ATC) in both visual (VFR) and instrument (IFR) environments.

## PERFORMANCE OBJECTIVE

P3.3 Given a simulation of two aircraft in flight, one flying under VFR conditions and one flying under IFR conditions, identify with 80% accuracy four differences in how ATC controls each aircraft.

## CRITERION-REFERENCED MEASURE

C3.3 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Visit the ATC facility at Richmond International Airport.
2. Listen to tapes of conversations between ATC and pilots.
3. Use the JS video *The Flight Environment* to illustrate ATC procedures under VFR and IFR conditions.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.4 Demonstrate use of a transponder, and explain its function.

## PERFORMANCE OBJECTIVE

P3.4 Given access to the cockpit of the ATC simulator, dial an emergency IFR and VFR code on the radar transponder, and explain with 100% accuracy how these codes are interpreted by the ATC controller.

## CRITERION-REFERENCED MEASURE

P3.4 Demonstration, 100% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Practice dialing codes on classroom mockups of transponders and on transponders in both simulators.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.5 Explain the Federal Aviation Regulations (FARs) concerning visibility and distance from clouds when operating visually in controlled airspace.

## PERFORMANCE OBJECTIVE

P3.5 Given the three divisions of altitudes in controlled airspace, state with 75% accuracy the FARs concerning visibility and distance from clouds for each of the altitude divisions.

## CRITERION-REFERENCED MEASURE

C3.5 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review the FARs concerning VFR restrictions in controlled airspace.
2. Review the charts in the textbook concerning visibility and distance from clouds when operating in controlled airspace.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.6 Describe the dimensions, altitude limits, and restrictions for the federal airways.

## PERFORMANCE OBJECTIVE

P3.6 Given an enroute FLIP, identify an airway and describe its width, base, ceiling, and cruising altitude requirements. Answer must be 75% accurate.

## CRITERION-REFERENCED MEASURE

C3.6 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Note how federal airways are depicted and connected on sectional and enroute low altitude FLIP charts.

2. Divide class into pairs. Have them use enroute low altitude FLIPs and sectional charts to plot a trip using five legs of one airway and a trip using three connecting airways.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.7 Explain the Federal Aviation Regulations (FARs) concerning visibility and distance from clouds when operating visually in uncontrolled airspace.

## PERFORMANCE OBJECTIVE

P3.7 Given an aeronautical chart, indicate with 75% accuracy the FARs concerning visibility and distance from clouds for each of the three divisions of altitude in uncontrolled airspace.

## CRITERION-REFERENCED MEASURE

C3.7 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review the FARs concerning VFR restrictions in uncontrolled airspace.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.8 Explain the Federal Aviation Regulations (FARs) concerning each of the five divisions of special use airspace.

## PERFORMANCE OBJECTIVE

P3.8 Given a FLIP or sectional chart, explain with 75% accuracy the FARs for the following: prohibited area; restricted area; warning area; military operations area; and alert area.

## CRITERION-REFERENCED MEASURE

C3.8 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Note how special use airspace is depicted on FLIP and sectional charts.
2. Note how the air defense identification zone (ADIZ) and military training routes are depicted on FLIP and sectional charts.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 3. UNDERSTANDING FEDERAL AVIATION REGULATIONS (FARs) CONCERNING CONTROLLED, UNCONTROLLED, AND SPECIAL USE AIRSPACE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

3.9 Explain the purpose of a Notice to Airman (NOTAM) and how pilots check for NOTAMs prior to a flight.

## PERFORMANCE OBJECTIVE

P3.9 Given a simulated event concerning civilian and military pilots but not covered by FARs, explain with 75% accuracy how the FAA would make this information available to all pilots and how pilots would check for this information before a flight.

## CRITERION-REFERENCED MEASURE

C3.9 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Visit the Air National Guard Operations Section, and have personnel brief students on how a military pilot prepares for a flight.
2. Review and interpret outdated NOTAMs.

# RESOURCES

**TASK 3.1**

Equipment and Material:
- Sectional charts
- Low altitude flight information publications (FLIPs)

Reference:
- *Federal Aviation Regulations*. FAA

**TASK 3.2**

Equipment and Material:
- Sectional charts
- Low altitude flight information publications (FLIPs)

**TASK 3.3**

Audiovisuals:
- ATC-pilot taped conversations
- *The Flight Environment* (videotape). Jeppesen Sanderson.

**TASK 3.4**

Equipment and Material:
- GAT-1 simulator
- ATC simulator
- Transponder mockups

**TASK 3.5**

References:
- *Federal Aviation Regulations*. FAA.
- *Aviation Fundamentals*. 2nd ed. Jeppesen Sanderson.

**TASK 3.6**

Equipment and Material:
- Flight information publications (FLIPs)
- Sectional charts

**TASK 3.7**

Equipment and Material:
- Aeronautical charts

Reference:
- *Federal Aviation Regulations*. FAA.

## CONCEPT/DUTY AREA

4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMU :ICATIONS

## TASKS/COMPETENCIES

4.1 Describe the capabilities and limitations of the very high fr uency (VHF) radio.

4.2 Demonstrate tuning procedures for a VHF radio.

4.3 Demonstrate the procedures for speaking clearly and concis y on an aircraft radio.

4.4 Explain the function of CTAF, UNICOM, and MULTICOM.

4.5 Explain the procedures for common traffic advisory commur :ations around an uncontrolled airport.

4.6 Explain the function of a flight service station (FSS).

## CONCEPT/DUTY AREA

4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMUNICATIONS

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

4.1 Describe the capabilities and limitations of the very high frequency (VHF) radio.

## PERFORMANCE OBJECTIVE

P4.1 Given information on and an actual VHF radio, provide the following information with 80% accuracy: frequency range, a description of the aircraft antennae, and reception range.

## CRITERION-REFERENCED MEASURE

C4.1 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students review photographs of light aircraft and pick out the VHF antennae.

2. Have students handle an actual VHF radio from a light aircraft and then draw the location of the radio control knobs from memory.

| CONCEPT/DUTY AREA | COURSE |
| --- | --- |
| 4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMUNIATIONS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

4.2 Demonstrate tuning procedures for a VHF radio.

## PERFORMANCE OBJECTIVE

P4.2 Given a VHF radio, demonstrate with 80% accuracy the procedure for turning it on, adjusting the volume, dialing a frequency, and adjusting the squelch.

## CRITERION-REFERENCED MEASURE

C4.2 Demonstration, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparencies 7184-7186 to illustrate the correct operation of a VHF radio.
2. Have students sit in the simulators and practice procedures with the VHF radio.
3. Have students tune the classroom VHF scanner and monitor conversations between pilots and Air Traffic Control.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMUNICATIONS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

4.3 Demonstrate the procedures for speaking clearly and concisely on an aircraft radio.

## PERFORMANCE OBJECTIVE

P4.3 Given an aircraft identification, location, altitude, and a specific request, write out and transmit an appropriate radio message to Air Traffic Control. Performance must be 80% accurate.

## CRITERION-REFERENCED MEASURE

C4.3 Written and transmitted message, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparency 7188 to illustrate proper communication procedures.
2. Have students listen to tapes of pilot/ATC conversations.
3. Have students listen to classroom scanner and monitor pilot/ATC conversations.
4. Use FAA video *Safety III--Basic Radio Procedures for Pilots* to demonstrate proper radio procedures.
5. Give students a list of situations requiring a pilot to give a message to ATC. Have them pair up (one acting as pilot, the other as ATC) and practice transmitting messages to one another, using proper radio communication procedures.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMUNICATIONS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

4.4 Explain the function of CTAF, UNICOM, and MULTICOM.

## PERFORMANCE OBJECTIVE

P4.4 Given information on CTAF, UNICOM, and MULTICOM frequencies, explain with 75% accuracy under what conditions a pilot would communicate with each.

## CRITERION-REFERENCED MEASURE

C4.4 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review JS transparency 7185, and discuss the various radio facilities.
2. Review a sectional chart, and identify the CTAF, UNICOM, and MULTICOM frequencies where depicted.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 4. *UNDERSTANDING USE* OF AIRCRAFT RADIO COMMUNICATIONS | *Aviation* Pilot Training I (Semester II) |

## TASK/COMPETENCY

4.5 Explain the procedures for common traffic advisory communications around an uncontrolled airport.

## PERFORMANCE OBJECTIVE

P4.5 Given three situations on the ground and three situations in the air at an uncontrolled airport, provide with 75% accuracy the appropriate radio transmissions on a CTAF, UNICOM, or MULTICOM frequency.

## CRITERION-REFERENCED MEASURE

C4.5 Six transmissions, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Show a diagram of an uncontrolled airport, and have students identify all locations in the air and on the ground where pilots should report their positions and intentions to local traffic. Have students give an example of an appropriate transmission to make from each identified location.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 4. UNDERSTANDING USE OF AIRCRAFT RADIO COMMUNICATIONS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

4.6 Explain the function of a flight service station (FSS).

## PERFORMANCE OBJECTIVE

P4.6 Given a list of 10 services performed by FAA agencies, identify with 85% accuracy those services performed exclusively by the FSS.

## CRITERION-REFERENCED MEASURE

C4.6 Written test, 85% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students tour the Leesburg FSS and observe the normal routine.
2. Have students write four FAA agencies (center, approach control, control tower, and FSS) and then work in pairs to compile a list of services performed by each agency.

# RESOURCES

**TASK 4.1**

Equipment and Material:
- VHF radio
- Photographs of light aircraft

**TASK 4.2**

Equipment and Material:
- VHF radio
- ATC simulator
- GAT-1 simulator
- VHF scanner

Audiovisuals:
- Transparencies 7184-7186. Jeppesen Sanderson.

**TASK 4.3**

Equipment and Material:
- VHF scanner
- Sample communication situations

Audiovisuals:
- ATC-pilot taped conversations
- Transparency 7188. Jeppesen Sanderson.
- *Safety III--Basic Radio Procedures for Pilots* (videotape). FAA.

**TASK 4.4**

Equipment and Material:
- VHF radio

Audiovisuals:
- Transparency 7185. Jeppesen Sanderson.

**TASK 4.5**

Equipment and Material:
- VHF radio
- Diagrams of uncontrolled airport

## CONCEPT/DUTY AREA

5. UNDERSTANDING BASIC PROCEDURES FOR PREFLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT

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## TASKS/COMPETENCIES

5.1 Describe the procedures for entries in the pilot's logbook.

5.2 Explain the documents carried in and associated with an aircraft.

5.3 Explain the procedures for servicing and preflighting an aircraft.

5.4 Explain the use of checklists in aviation.

5.5 Demonstrate the procedure for starting a typical light aircraft.

5.6 Describe taxi procedures for a typical light aircraft.

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## CONCEPT/DUTY AREA

5. UNDERSTANDING BASIC PROCEDURES FOR PRE-FLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

5.1 Describe the procedures for entries in the pilot's logbook.

## PERFORMANCE OBJECTIVE

P5.1 Given the receipts for five flights, make the correct entries in a page of a pilot's logbook. Entries must be 80% accurate.

## CRITERION-REFERENCED MEASURE

C5.1 Entries in pilot's logbook, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students practice entering information in sample pages of a pilot's logbook.
2. Use the overhead projector to illustrate proper entries in logbooks.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 5. UNDERSTANDING BASIC PROCEDURES FOR PRE-FLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

5.2 Explain the documents carried in and associated with an aircraft.

## PERFORMANCE OBJECTIVE

P5.2 Given information on aircraft documents, list and explain with 80% accuracy the purpose of the three documents normally carried in seat pockets or the baggage compartment.

## CRITERION-REFERENCED MEASURE

C5.2 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Provide students with a copy of a pilot's operating handbook (POH), an aircraft logbook, and checklists, and explain how the pilot uses the information in each.

2. Have students practice using the checklists in the simulator.

## CONCEPT/DUTY AREA

5. UNDERSTANDING BASIC PROCEDURES FOR PRE-FLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

5.3 Explain the procedures for servicing and preflighting an aircraft.

## PERFORMANCE OBJECTIVE

P5.3 Given a diagram of a Cessna 152 aircraft, describe with 75% accuracy three items that require routine servicing and 12 items that are routinely included in a preflight check.

## CRITERION-REFERENCED MEASURE

C5.3 Written test and demonstration, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Walk around the static aircraft with students, and identify the servicing points and areas to check on a typical preflight.

2. Discuss actual aircraft accidents where improper preflight was a factor.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 5. UNDERSTANDING BASIC PROCEDURES FOR PRE-FLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

5.4 Explain the use of checklists in aviation.

## PERFORMANCE OBJECTIVE

P5.4 Given the route from parking place to takeoff, list (1) the names of five checklists normally used prior to adding the power for takeoff and (2) two items normally found on each of the five checklists. Answer must be 80% accurate.

## CRITERION-REFERENCED MEASURE

C5.4 Written test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Show students examples of the various checklists used in a typical light aircraft; explain the procedures for their use and why pilots must use the checklists rather than rely on memory.
2. Have students practice using the checklists in starting the GAT-1 simulator.
3. Discuss actual aircraft accidents where improper use of checklists was a factor.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 5. UNDERSTANDING BASIC PROCEDURES FOR PRE-FLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

5.5 Demonstrate the procedure for starting a typical light aircraft.

## PERFORMANCE OBJECTIVE

P5.5 Given access to the simulator cockpit, demonstrate with 85% accuracy the steps in starting a typical light aircraft.

## CRITERION-REFERENCED MEASURE

C5.5 Demonstration, 85% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students work in pairs and review the steps in starting the engine of a typical light aircraft.
2. Have students practice the starting procedure in the GAT-1 simulator.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 5. UNDERSTANDING BASIC PROCEDURES FOR PRE-FLIGHT, START, AND TAXI FOR A TYPICAL LIGHT AIRCRAFT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

5.6 Describe taxi procedures for a typical light aircraft.

## PERFORMANCE OBJECTIVE

P5.6 Given the situation of an aircraft sitting on the ramp with engine running, describe with 80% accuracy the steps in leaving the parking spot and taxiing through the ramp area to the pretakeoff position.

## CRITERION-REFERENCED MEASURE

C5.6 Written or oral test, 80% accuracy.

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the chalkboard and diagrams to explain the steps in taxiing from parking spot to takeoff.

# RESOURCES

**TASK 5.1**

Equipment and Material:
- Sample pages for pilot's logbook
- Overhead projector

**TASK 5.2**

Equipment and Material:
- Pilot's operating handbooks
- Sample aircraft documents
- ATC simulator

**TASK 5.3**

Equipment and Material:
- Diagrams of Cessna 152 aircraft
- Static aircraft

**TASK 5.4**

Equipment and Material:
- Light aircraft checklists
- GAT-1 simulator

**TASK 5.5**

Equipment and Material:
- GAT-1 simulator

**TASK 5.6**

Equipment and Material:
- Diagrams of airport taxiways and runways

## CONCEPT/DUTY AREA

6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT

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## TASKS/COMPETENCIES

6.1 Explain the purpose of items on the pretakeoff checklist of a typical light aircraft.

6.2 Explain the procedures for takeoff in a typical light aircraft.

6.3 Explain the procedures for straight and level flight, shallow turns, descents, and climbs in a typical light aircraft.

6.4 Explain the procedure for entering the landing pattern of an uncontrolled airport.

6.5 Explain the steps in the normal landing pattern for a typical light aircraft.

6.6 Explain the procedures for taxiing to the ramp area and securing a typical light aircraft.

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| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

6.1 Explain the purpose of items on the pretakeoff checklist of a typical light aircraft.

## PERFORMANCE OBJECTIVE

P6.1 Given information on light aircraft takeoff procedures, name five items on the pretakeoff checklist, and explain the purpose of each. Answer must be 80% accurate.

## CRITERION-REFERENCED MEASURE

C6.1 Written or oral test, 80% accuracy.

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students divide into pairs and practice going over the items on a pretakeoff check.
2. Have students practice the pretakeoff checklist in the GAT-1 simulator.

## CONCEPT/DUTY AREA

6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

6.2 Explain the procedures for takeoff in a typical light aircraft.

## PERFORMANCE OBJECTIVE

P6.2 Given a diagram of a typical municipal airport, explain with 85% accuracy the procedures for taxiing to the takeoff position and the actual takeoff.

## CRITERION-REFERENCED MEASURE

C6.2 Written or oral test, 85% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Divide class into pairs, and have them go over taxi and takeoff procedures.

## CONCEPT/DUTY AREA

6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

6.3 Explain the procedures for straight and level flight, shallow turns, descents, and climbs in a typical light aircraft.

## PERFORMANCE OBJECTIVE

P6.3 Given access to the rudder pedals, control yoke, and throttle in the simulator, describe with 75% accuracy the movement of each in straight and level flight; shallow turns; descents; and climbs.

## CRITERION-REFERENCED MEASURE

C6.3 Demonstration, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Divide class into pairs, and have them quiz each other on the coordination of controls in level flight, climbs, descents, and turns.

2. Have students practice level flight, climbs, descents, and turns in the GAT-1 simulator.

## CONCEPT/DUTY AREA

6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

6.4 Explain the procedure for entering the landing pattern of an uncontrolled airport.

## PERFORMANCE OBJECTIVE

P6.4 Given a diagram of an uncontrolled airport, explain with 80% accuracy the procedure for entering the landing pattern.

## CRITERION-REFERENCED MEASURE

C6.4 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use enlarged airfield diagrams and overhead projector to explain how to enter a landing pattern at an uncontrolled airport.

2. Have students review radio procedures and indicate on a chart where appropriate radio calls are required when entering a landing pattern.

## CONCEPT/DUTY AREA

6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

6.5 Explain the steps in the normal landing pattern for a typical light aircraft.

## PERFORMANCE OBJECTIVE

P6.5 Given a diagram of a typical municipal airport, explain with 75% accuracy the appropriate procedures at the following checkpoints in a normal landing sequence: downwind, base, final, threshold, touchdown, and turnoff.

## CRITERION-REFERENCED MEASURE

C6.5 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Divide class into pairs, and have them quiz each other concerning the landing checklist and the procedures at each checkpoint in a landing pattern.

2. Use enlarged airfield diagrams and overhead projector to explain the procedures in a landing pattern.

## CONCEPT/DUTY AREA

6. UNDERSTANDING BASIC PROCEDURES FOR TAKEOFF AND LANDING IN A TYPICAL LIGHT AIRCRAFT

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

6.6 Explain the procedures for taxiing to the ramp area and securing a typical light aircraft.

## PERFORMANCE OBJECTIVE

P6.6 Given a diagram of an uncontrolled airfield, explain with 80% accuracy the procedures for taxiing to the ramp area and securing the aircraft.

## CRITERION-REFERENCED MEASURE

C6.6 Written or oral test, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the chalkboard and diagrams to show the procedures for taxiing to the ramp area and securing the aircraft.

2. Use the static aircraft to demonstrate and practice securing an aircraft after flight.

# RESOURCES

**TASK 6.1**

| | |
|---|---|
| Equipment and Material: | Pretakeoff checklists<br>GAT-1 simulator |

**TASK 6.2**

| | |
|---|---|
| Equipment and Material: | Airport diagrams |

**TASK 6.3**

| | |
|---|---|
| Equipment and Material: | GAT-1 simulator |

**TASK 6.4**

| | |
|---|---|
| Equipment and Material: | Diagrams of uncontrolled airport<br>Overhead projector |
| Audiovisuals: | Enlarged airfield diagrams |

**TASK 6.5**

| | |
|---|---|
| Equipment and Material: | Airport diagrams<br>Overhead projector |
| Audiovisuals: | Enlarged airfield diagrams |

**TASK 6.6**

| | |
|---|---|
| Equipment and Material: | Diagrams of uncontrolled airport<br>Static aircraft |

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

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## TASKS/COMPETENCIES

7.1 Identify the composition of the atmosphere.

7.2 Explain how heat, pressure, and the earth's rotation create global wind patterns.

7.3 Explain how local geographical features affect local wind patterns.

7.4 Define meteorological terms.

7.5 Explain how temperature and moisture affect the stability of the air.

7.6 Describe the characteristics of the three families of clouds.

7.7 Explain the characteristics of four air mass boundaries: cold fronts, warm fronts, stationary fronts, and occluded fronts.

7.8 Explain the flight hazards caused by thunderstorms.

7.9 Explain the formation of radiation and advection fog and their dangers for aviation.

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## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.1 Identify the composition of the atmosphere.

## PERFORMANCE OBJECTIVE

P7.1 Given a diagram of the earth and layers of atmosphere, identify with 75% accuracy the four layers and six gases that make up the atmosphere.

## CRITERION-REFERENCED MEASURE

C7.1 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the chalkboard and overhead projector to illustrate the composition of the atmosphere.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.2 Explain how heat, pressure, and the earth's rotation create global wind patterns.

## PERFORMANCE OBJECTIVE

P7.2 Given information on air masses and their movements over the earth's surface, explain with 75% accuracy how convection, atmospheric pressure, and coriolis force each cause air to move.

## CRITERION-REFERENCED MEASURE

C7.2 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparency 7096 and 7108 to explain wind currents.
2. Review National Weather Service wind charts.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

7.3 Explain how local geographical features affect local wind patterns.

## PERFORMANCE OBJECTIVE

P7.3 Given a description of an area with water, mountains, and valleys, explain with 75% accuracy how each of these geographical features affects the wind patterns.

## CRITERION-REFERENCED MEASURE

C7.3 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Compare land and sea breeze patterns in coastal Virginia with valley and mountain wind patterns in western Virginia.
2. Use JS transparencies 7123 and 7124 to illustrate how winds are affected by surface features.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.4 Define meteorological terms.

## PERFORMANCE OBJECTIVE

P7.4 Given information and discussion on meteorological terminology, define with 75% accuracy the following terms: humidity, condensation, sublimation, evaporation, relative humidity, saturation, dewpoint, temperature/dewpoint spread, precipitation, and freezing rain.

## CRITERION-REFERENCED MEASURE

C7.4 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS video *Meteorology for Pilots* to review weather theory.
2. Use JS transparency 7092 to discuss dewpoint and dewpoint spread.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.5 Explain how temperature and moisture affect the stability of the air.

## PERFORMANCE OBJECTIVE

P7.5 Given information on masses of stable and unstable air, explain with 75% accuracy the temperature and moisture characteristics of both air masses and their effect on air stability.

## CRITERION-REFERENCED MEASURE

C7.5 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use FAA video *Basic Aviation Weather* to discuss air stability.
2. Discuss aircraft accidents where clear but unstable air was a factor.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.6 Describe the characteristics of the three families of clouds.

## PERFORMANCE OBJECTIVE

P7.6 Given information on the three families of clouds (low, middle, and high), provide with 75% accuracy the normal altitude range, cloud types (including combinations), general description, turbulence, and precipitation associated with each family.

## CRITERION-REFERENCED MEASURE

C7.6 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review the cloud chart, and compare various cloud types and their characteristics.
2. Have students keep a cloud chart for one week, noting the types of clouds they observe the same time each day and commenting on what a pilot could expect by flying into those clouds.
3. Have students review photographs from magazines and books and identify the cloud types in each photograph.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.7 Explain the characteristics of four air mass boundaries: cold fronts, warm fronts, stationary fronts, and occluded fronts.

## PERFORMANCE OBJECTIVE

P7.7 Given information on four air mass boundaries, explain with 75% accuracy the characteristics of the following: cold fronts, warm fronts, stationary fronts, and occluded fronts.

## CRITERION-REFERENCED MEASURE

C7.7 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparencies 7114-7121 to compare fronts.
2. Use FAA film *The Cold Front* to illustrate the characteristics of cold fronts.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.8 Explain the flight hazards caused by thunderstorms.

## PERFORMANCE OBJECTIVE

P7.8 Given information on thunderstorms, explain with 75% accuracy five flight hazards associated with turbulence, ice, and heavy rain.

## CRITERION-REFERENCED MEASURE

C7.8 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Discuss the causes and characteristics of thunderstorms.
2. Use FAA video *Thunderstorms--Don't Flirt-Skirt 'Em* to explain the dangers of flying in thunderstorms.
3. Discuss aircraft accidents where thunderstorms were a factor.
4. Use FAA video *The Windshear Factor--Microburst* to explain the extreme danger of windshear.

## CONCEPT/DUTY AREA

7. UNDERSTANDING THE EFFECT OF WEATHER ON FLIGHT PERFORMANCE

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

7.9 Explain the formation of radiation and advection fog and their dangers for aviation.

## PERFORMANCE OBJECTIVE

P7.9 Given information on radiation and advection fog, explain with 75% accuracy how they are formed and why they are so dangerous for aviators.

## CRITERION-REFERENCED MEASURE

C7.9 Written test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparencies 7098 and 7099 to explain advection and radiation fog.
2. Use FAA video *Fog and Low Ceiling Clouds--Advection Fog and Ground Fog* to explain how fog is formed and the dangers of fog to aviation.

# RESOURCES

**TASK 7.1**

Equipment and Material:
- Diagrams of earth and layers of atmosphere
- Overhead projector

Audiovisuals:
- Enlarged diagrams of earth and layers of atmosphere

**TASK 7.2**

Equipment and Material:
- National Weather Service wind charts

Audiovisuals:
- Transparencies 7096, 7108. Jeppesen Sanderson.

**TASK 7.3**

Equipment and Material:
- National Weather Service wind charts

Audiovisuals:
- Transparencies 7123, 7124. Jeppesen Sanderson.

**TASK 7.4**

Audiovisuals:
- *Meteorology for Pilots* (videotape). Jeppesen Sanderson.
- Transparency 7092. Jeppesen Sanderson.

**TASK 7.5**

Audiovisuals:
- *Basic Aviation Weather* (videotape). FAA.

**TASK 7.6**

Equipment and Material:
- Cloud charts
- Photographs showing various types of clouds

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

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## TASKS/COMPETENCIES

8.1 Explain each of the 10 elements on a Surface Aviation Weather Report (SAWR).

8.2 Interpret routine coded weather data found on a Surface Aviation Weather Report (SAWR).

8.3 Explain the contents and purpose of Radar Weather Reports (RAREPs).

8.4 Explain the scope and contents of a Terminal Weather Forecast (FT).

8.5 Explain the scope and contents of an Area Forecast (FA).

8.6 Interpret the contents of a Winds and Temperatures Aloft Forecast.

8.7 Explain the purpose of and interpret the data from a Severe Weather Watch Bulletin (WW).

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## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.1 Explain each of the 10 elements on a Surface Aviation Weather Report (SAWR).

## PERFORMANCE OBJECTIVE

P8.1 Given a Surface Aviation Weather Report (SAWR), explain with 75% accuracy each of the 10 elements the report provides.

## CRITERION-REFERENCED MEASURE

C8.1 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparencies 7126 and 7132 to illustrate the SAWR.
2. Review SAWRs from the Air National Guard Operations.

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.2 Interpret routine coded weather data found on a Surface Aviation Weather Report (SAWR).

## PERFORMANCE OBJECTIVE

P8.2 Given a sample Surface Aviation Weather Report, interpret with 75% accuracy the code for all 10 elements.

## CRITERION-REFERENCED MEASURE

C8.2 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review JS transparency 7132 regarding the SAWR.
2. Divide class into pairs, and give each pair sample SAWRs. Have students quiz each other on coded data given.

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.3 Explain the contents and purpose of Radar Weather Reports (RAREPs).

## PERFORMANCE OBJECTIVE

P8.3 Given a sample Radar Weather Report, explain with 75% accuracy what information it contains and how a pilot uses it in flight planning.

## CRITERION-REFERENCED MEASURE

C8.3 Written or oral test, 75% accuracy.

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use sample RAREPs to illustrate the reporting of precipitation patterns.

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.4 Explain the scope and contents of a Terminal Weather Forecast (FT).

## PERFORMANCE OBJECTIVE

P8.4 Given a sample Terminal Weather Forecast, explain with 75% accuracy the items covered in the report and the area that it covers.

## CRITERION-REFERENCED MEASURE

C8.4 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS video *Interpreting Weather Data* to provide an overall review of weather reporting.
2. Have students pair up and quiz each other on the contents of a sample FT.
3. Give students a geographical place and a variety of weather data. Have them pair up and create a Terminal Forecast.

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.5 Explain the scope and contents of an Area Forecast (FA).

## PERFORMANCE OBJECTIVE

P8.5 Given a sample Area Forecast, explain with 75% accuracy the items covered in the report and the area that it covers.

## CRITERION-REFERENCED MEASURE

C8.5 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students pair up and quiz each other on the contents of a sample FA.
2. Give students a geographical place and a variety of weather data. Have them pair up and create an Area Forecast.

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.6 Interpret the contents of a Winds and Temperatures Aloft Forecast.

## PERFORMANCE OBJECTIVE

P8.6 Given a sample Winds and Temperatures Aloft Forecast, provide with 75% accuracy the winds and temperatures for each altitude shown.

## CRITERION-REFERENCED MEASURE

C8.6 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use a sample Winds and Temperatures Aloft Forecast to explain how to interpret the information.

1. Give students a geographical place and a variety of winds/temperatures for given altitudes. Have them create an appropriate forecast with the data provided.

## CONCEPT/DUTY AREA

8. UNDERSTANDING HOW TO INTERPRET WRITTEN WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

8.7 Explain the purpose of and interpret the data from a Severe Weather Watch Bulletin (WW).

## PERFORMANCE OBJECTIVE

P8.7 Given a sample Severe Weather Watch Bulletin (WW), explain the use of the bulletin and interpret the data it contains.

## CRITERION-REFERENCED MEASURE

C8.7 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use old WWs to explain the bulletin's data and function.
2. Study accident reports where one of the following conditions existed:
    a. Severe weather was the cause of the accident.
    b. The pilot was aware of the forecast but ignored the warning.
    c. A WW had been issued but the pilot did not check for WWs during his flight planning.

# RESOURCES

**TASK 8.1**

Equipment and Material: Surface Aviation Weather Reports

Audiovisuals: Transparencies 7126, 7132. Jeppesen Sanderson.

**TASK 8.2**

Equipment and Material: Surface Aviation Weather Reports

Audiovisuals: Transparency 7132. Jeppesen Sanderson.

**TASK 8.3**

Equipment and Material: Radar Weather Reports

**TASK 8.4**

Equipment and Material: Terminal Weather Forecasts

Audiovisuals: *Interpreting Weather Data* (videotape). Jeppesen Sanderson.

**TASK 8.5**

Equipment and Material: Area Forecasts

**TASK 8.6**

Equipment and Material: Winds and Temperatures Aloft Forecasts

**TASK 8.7**

Equipment and Material: Severe Weather Watch Bulletins

## CONCEPT/DUTY AREA

9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA

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## TASKS/COMPETENCIES

9.1 Explain the purpose of and interpret the data in a surface analysis chart.

9.2 Explain the purpose of and interpret the data on a weather depiction chart.

9.3 Explain the purpose of and interpret the data in a radar summary chart.

9.4 Explain the purpose of and interpret the data in each of the four panels in a low-level significant weather prognosis.

9.5 Explain the contents of a typical preflight weather briefing and the source of each item in the briefing.

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## CONCEPT/DUTY AREA

9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

9.1 Explain the purpose of and interpret the data in a surface analysis chart.

## PERFORMANCE OBJECTIVE

P9.1 Given 10 station models on a surface analysis chart, explain with 75% accuracy the purpose of the chart, and interpret the data in each of the models.

## CRITERION-REFERENCED MEASURE

C9.1 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use old surface analysis charts to explain the proper interpretation of the symbols in a station model.

## CONCEPT/DUTY AREA

9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

9.2 Explain the purpose of and interpret the data on a weather depiction chart.

## PERFORMANCE OBJECTIVE

P9.2 Given a designated region on a weather depiction chart, describe with 75% accuracy the weather in the region, and explain how the chart helps a pilot in flight planning.

## CRITERION-REFERENCED MEASURE

C9.2 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use old weather depiction charts to practice interpreting the data shown.

## CONCEPT/DUTY AREA

9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

9.3 Explain the purpose of and interpret the data in a radar summary chart.

## PERFORMANCE OBJECTIVE

P9.3 Given a designated region on a radar summary chart, describe with 75% accuracy the precipitation pattern in the region, and explain how this information can help the pilot in flight planning.

## CRITERION-REFERENCED MEASURE

C9.3 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use old radar summary charts to practice interpreting the data given.

## CONCEPT/DUTY AREA

9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

9.4 Explain the purpose of and interpret the data in each of the four panels in a low-level significant weather prognosis.

## PERFORMANCE OBJECTIVE

P9.4 Given a low-level significant weather prognosis, explain with 75% accuracy the purpose of the prognosis, and identify a significant weather pattern for each of the four panels.

## CRITERION-REFERENCED MEASURE

C9.4 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Review the JS video *Interpreting Weather Data*.
2. Use old low-level significant weather prognosis charts to practice interpreting weather data.

## CONCEPT/DUTY AREA

9. UNDERSTANDING HOW TO INTERPRET GRAPHIC WEATHER DATA

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

9.5 Explain the contents of a typical preflight weather briefing and the source of each item in the briefing.

## PERFORMANCE OBJECTIVE

P9.5 Given a typical weather briefing, explain with 75% accuracy each of the nine items included, and indicate at least one source from which each item can be obtained.

## CRITERION-REFERENCED MEASURE

C9.5 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Monitor actual and taped aviation weather reports given on Flight Service Stations (FSSs), Automatic Terminal Information Service (ATIS), transcribed weather broadcasts given on navigational aids, enroute flight advisory service, and in-flight weather advisories. Have students write down portions of significant weather data.

2. Have students review typical completed VFR and IFR flight plans and interpret the weather data.

# RESOURCES

**TASK 9.1**

| | |
|---|---|
| Equipment and Material: | Surface analysis charts |

**TASK 9.2**

| | |
|---|---|
| Equipment and Material: | Weather depiction charts |

**TASK 9.3**

| | |
|---|---|
| Equipment and Material: | Radar summary charts |

**TASK 9.4**

| | |
|---|---|
| Equipment and Material: | Low-level significant weather prognosis charts |
| Audiovisuals: | *Interpreting Weather Data* (videotape). Jeppesen Sanderson. |

**TASK 9.5**

| | |
|---|---|
| Equipment and Material: | Completed VFR and IFR flight plans |
| Audiovisuals: | Taped aviation weather reports |

## CONCEPT/DUTY AREA

10. UNDERSTANDING BASIC NAVIGATIONAL CHARTS

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## TASKS/COMPETENCIES

10.1 Describe the general scope and scale of sectional charts and world aeronautical charts (WACs) and how they are named.

10.2 Determine longitude and latitude on a sectional chart.

10.3 Identify natural geographical features on a sectional chart by using the symbols provided in the chart legend.

10.4 Identify man-made features and navigational aids on a sectional chart by using the chart legend.

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## CONCEPT/DUTY AREA

10. UNDERSTANDING BASIC NAVIGATIONAL CHARTS

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

10.1 Describe the general scope and scale of sectional charts and world aeronautical charts (WACs) and how they are named.

## PERFORMANCE OBJECTIVE

P10.1 Given a sectional chart and a world aeronautical chart, describe with 75% accuracy the areas covered, the scale of each, and how the charts are named for reference.

## CRITERION-REFERENCED MEASURE

C10.1 Written or oral test, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Distribute old sectional and WAC charts for students to compare. Have them practice measuring distances and learn how pilots can identify them for reference.
2. Use JS transparency 7134 to explain scale.

## CONCEPT/DUTY AREA

10. UNDERSTANDING BASIC NAVIGATIONAL CHARTS

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

10.2 Determine longitude and latitude on a sectional chart.

## PERFORMANCE OBJECTIVE

P10.2 Given 10 geographical positions on a sectional chart, determine within ± one degree the longitude and latitude of at least seven of the 10 positions.

## CRITERION-REFERENCED MEASURE

C10.2 Determination of longitude and latitude within ± one degree for seven of 10 geographical positions

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparencies 7138 and 7142 to explain longitude and latitude.
2. Use old sectional charts to practice locating positions by using longitude and latitude.

## CONCEPT/DUTY AREA

10. UNDERSTANDING BASIC NAVIGATIONAL CHARTS

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

10.3 Identify natural geographical features on a sectional chart by using the symbols provided in the chart legend.

## PERFORMANCE OBJECTIVE

P10.3 Given a sectional chart with 20 geographical features, identify with 100% accuracy 18 of the 20 by using the legend provided on the chart.

## CRITERION-REFERENCED MEASURE

C10.3 Written or oral test, 100% accuracy for 18 of 20 features

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use old sectional charts to practice identifying geographical features.
2. Use old sectional charts to practice locating geographical features by longitude and latitude.

## CONCEPT/DUTY AREA

10. UNDERSTANDING BASIC NAVIGATIONAL CHARTS

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

10.4 Identify man-made features and navigational aids on a sectional chart by using the chart legend.

## PERFORMANCE OBJECTIVE

P10.4 Given a sectional chart with a combination of 20 man-made features and navigational aids, identify 18 of the 20 by using the chart legend.

## CRITERION-REFERENCED MEASURE

C10.4 Written or oral test, 18 of 20 items correctly identified

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use old sectional charts to practice identifying man-made features and navigational aids.
2. Use old sectional charts to practice locating man-made features by using longitude and latitude.

# RESOURCES

**TASK 10.1**

| | |
|---|---|
| Equipment and Material: | Sectional charts<br>World aeronautical charts |
| Audiovisuals: | Transparency 7134. Jeppesen Sanderson. |

**TASK 10.2**

| | |
|---|---|
| Equipment and Material: | Sectional charts |
| Audiovisuals: | Transparencies 7138, 7142. Jeppesen Sanderson. |

**TASK 10.3**

| | |
|---|---|
| Equipment and Material: | Sectional charts |

**TASK 10.4**

| | |
|---|---|
| Equipment and Material: | Sectional charts |

## CONCEPT/DUTY AREA

11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER

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## TASKS/COMPETENCIES

11.1 Explain the functions of the following components on a CSG computer: two discs, three windows, three slide scales, and conversion scales.

11.2 Solve a time-distance problem using the CSG computer.

11.3 Solve a fuel consumption problem using the CSG computer.

11.4 Solve an endurance problem using the CSG computer.

11.5 Solve a range (maximum distance with fuel remaining) problem using the CSG computer.

11.6 Determine airspeed using the CSG computer.

11.7 Find density altitude using the CSG computer.

11.8 Solve wind-heading-groundspeed problems using the CSG computer.

11.9 Convert temperature from centigrade to Fahrenheit, fuel from gallons to pounds, and miles from nautical to statute, using the CSG computer.

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## CONCEPT/DUTY AREA

111. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

11.1 Explain the functions of the following components on a CSG computer: two disks, three windows, three slide scales, and conversion scales.

## PERFORMANCE OBJECTIVE

P11.1 Given a CSG computer, explain with 75% accuracy the function of the following: two disks, three windows, three slide scales, and conversion scales.

## CRITERION-REFERENCED MEASURE

C11.1 Demonstration, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Distribute CSG computers to students. Use the E6B flight computer mockup to explain components and their functions.
2. Use JS transparencies 7136 and 7137 to illustrate use of the CSG computer.

## CONCEPT/DUTY AREA

11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

11.2 Solve a time-distance problem using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.2 Given a CSG computer and a problem providing a distance of 175 nautical miles and a ground speed of 117 nautical miles per hour (knots), provide within ± five minutes the time required to fly the distance.

## CRITERION-REFERENCED MEASURE

C11.2 Computer problem, accuracy of ± five minutes

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and provide several time-distance problems. Have students work in pairs to solve the problems.
3. Give students a sectional chart and five positions by longitude and latitude. Have them solve for time to fly each leg of trip using two different airspeeds.

## CONCEPT/DUTY AREA

11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

11.3 Solve a fuel consumption problem using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.3 Given a CSG computer and a problem providing four hours and nine gallons-per-hour consumption, solve within ± one gallon for fuel consumed.

## CRITERION-REFERENCED MEASURE

C11.3 Computer problem, accuracy within ± one gallon

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and provide several fuel consumption problems. Have students work in pairs and solve the problems.
3. Give students sectional charts with a route consisting of five connected man-made features as the checkpoints. Provide the groundspeed and gallons consumed per hour. Have students solve for distance between checkpoints, fuel consumed in gallons per leg, and total fuel consumed on the flight.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

11.4 Solve an endurance problem using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.4 Given a CSG computer and a problem providing 11 gallons of fuel consumed per hour and 42 gallons of usable fuel aboard, solve for endurance in hours and minutes. Answer must be accurate within ± 10 minutes.

## CRITERION-REFERENCED MEASURE

C11.4 Computer problem, accurate within ± 10 minutes.

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and provide several endurance problems. Have students work individually to solve problems.
3. Give students a sectional chart and a list of five geographical positions by longitude and latitude as checkpoints on a cross-country flight. Give the groundspeed, an altitude, amount of fuel on board on takeoff, and gallons consumed per hour. Have students solve for distance between points, time to fly each leg, gallons used per hour on each leg, total gallons consumed on the flight, and gallons remaining at the conclusion of the flight.

## CONCEPT/DUTY AREA

11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

11.5 Solve a range (maximum distance with fuel remaining) problem using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.5 Given a CSG computer and a problem providing amount of fuel on board and gallons consumed per mile, solve within ± five nautical miles for maximum range.

## CRITERION-REFERENCED MEASURE

C11.5 Computer problem, accurate within ± five miles

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and provide several range problems. Have students work individually to solve the problems.
3. Give students two geographical positions using longitude and latitude on a sectional chart. Provide groundspeed, altitude, fuel on board on takeoff, and gallons consumed per mile. Have students determine if the aircraft is capable of flying the distance assigned.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

11.6 Determine airspeed using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.6 Given a CSG computer, indicated airspeed (IAS), altitude, and temperature, solve within ± five knots for true airspeed (TAS) and calculated airspeed (CAS).

## CRITERION-REFERENCED MEASURE

C11.6 Computer problem, accurate within ± five knots

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and have them practice solving airspeed problems for TAS and CAS.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

11.7 Find density altitude using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.7 Given a CSG computer and a problem providing 5000 feet pressure altitude and 20 degrees Fahrenheit outside air temperature (OAT), solve within ± 200 feet for density altitude.

## CRITERION-REFERENCED MEASURE

C11.7 Computer problem, accurate within ± 200 feet

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and provide several density altitude problems. Have students work individually to solve the problems.
3. Give students a sectional chart, three names of small airports, an OAT for each airport, an aircraft type, and takeoff weight. Have students determine the density altitude at each airport, and calculate whether enough runway is available for a safe takeoff by using the appropriate POH for the aircraft type assigned.

## CONCEPT/DUTY AREA

11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER

## COURSE

Aviation Pilot Training I (Semester II)

## TASK/COMPETENCY

11.8 Solve wind-heading-groundspeed problems using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.8 Given a CSG computer and a problem providing TAS, wind direction and speed, and magnetic course, solve for magnetic compass heading and groundspeed. Answer must be accurate with ± two degrees and five knots respectively.

## CRITERION-REFERENCED MEASURE

C11.8 Computer problem, accurate within ± two degrees and ± five knots

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSC computers to students. Provide several wind-heading-groundspeed problems, and have students work individually to solve the problems.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 11. UNDERSTANDING HOW TO OPERATE THE SLIDE GRAPHIC COMPUTER | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

11.9 Convert temperature from centrigrade to Fahrenheit, fuel from gallons to pounds, and miles from nautical to statute, using the CSG computer.

## PERFORMANCE OBJECTIVE

P11.9 Given a CSG computer and a problem providing 27 degrees centigrade, 675 nautical miles, and 75 gallons of fuel, solve with 80% accuracy for degrees Fahrenheit, statute miles, and pounds of fuel.

## CRITERION-REFERENCED MEASURE

C11.9 Computer problem, 80% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the E6B mockup to guide class activities.
2. Distribute CSG computers to students, and provide several conversion problems for temperature, miles, and gallons. Have students work individually to solve problems.

# RESOURCES

**TASK 11.1**

| | |
|---|---|
| Equipment and Material: | CSG computers<br>E6B flight computer mockup |
| Audiovisuals: | Transparencies 7136, 7137, Jeppesen Sanderson. |

**TASK 11.2**

| | |
|---|---|
| Equipment and Material: | CSG computers<br>E6B flight computer mockup<br>Sectional charts<br>Time-distance problems |

**TASK 11.3**

| | |
|---|---|
| Equipment and Material: | CSG computers<br>E6B flight computer mockup<br>Sectional charts<br>Fuel consumption problems |

**TASK 11.4**

| | |
|---|---|
| Equipment and Material: | CSG computers<br>E6B flight computer mockup<br>Sectional charts<br>Endurance problems |

**TASK 11.5**

| | |
|---|---|
| Equipment and Material: | CSG computers<br>E6B flight computer mockup<br>Sectional charts<br>Range problems |

**TASK 11.6**

| | |
|---|---|
| Equipment and Material: | CSG computers<br>E6B flight computer mockup<br>Airspeed problems |

## CONCEPT/DUTY AREA

12. UNDERSTANDING THREE BASIC NAVIGATIONAL METHODS

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## TASKS/COMPETENCIES

12.1 Plot a course on a sectional chart.

12.2 Explain how to navigate by using the pilotage method.

12.3 Explain how to navigate by using the dead reckoning method.

12.4 Complete a navigation log.

12.5 Complete a VFR flight plan.

12.6 Make VFR position reports to Air Traffic Control (ATC).

12.7 Explain how to navigate by using VOR, DME, and ADF.

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| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.1 Plot a course on a sectional chart.

## PERFORMANCE OBJECTIVE

P12.1 Given a sectional chart, two geographical positions, and a navigation plotter, plot within ± five degrees the magnetic course between the positions.

## CRITERION-REFERENCED MEASURE

C12.1 Navigation problem, accuracy of ± five degrees

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the overhead projector to demonstrate plotting.
2. Have students work individually to practice plotting course lines, including magnetic variation, on a sectional chart.

| CONCEPT/DUTY AREA | COURSE |
| --- | --- |
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.2 Explain how to navigate by using the pilotage method.

## PERFORMANCE OBJECTIVE

P12.2 Given a sectional chart and a course line, identify with 75% accuracy 10 suitable geographical checkpoints and 10 man-made checkpoints that would assist a pilot in navigation.

## CRITERION-REFERENCED MEASURE

C12.2 Navigation problem, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Distribute sectional charts and assign various course lines. Have students practice selecting navigational checkpoints.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.3 Explain how to navigate by using the dead reckoning method.

## PERFORMANCE OBJECTIVE

P12.3 Given a sectional chart, a plotter, a TAS, a predicted wind direction and speed, and four geographical positions, plot with 75% accuracy three course lines between the positions given, provide compass headings, and mark each leg in 10-minute segments.

## CRITERION-REFERENCED MEASURE

C12.3 Navigation problem, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use the FAA film *Dead Reckoning* to illustrate the dead reckoning procedure.
2. Distribute sectional charts, and have students practice plotting course lines, figuring time-distance checks, and marking leg segments.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.4 Complete a navigation log.

## PERFORMANCE OBJECTIVE

P12.4 Given a sectional chart with a three-leg trip plotted on it and including course lines, speeds, altitudes, navigational aids, and fuel at takeoff, complete with 75% accuracy a standard VFR navigational log for the trip.

## CRITERION-REFERENCED MEASURE

C12.4 Completed navigational log, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Divide class into pairs, and have them practice making up their own flight and filling out the accompanying navigation log.
2. Use JS video *Basic Navigation* to summarize the VFR navigation procedures.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.5 Complete a VFR flight plan.

## PERFORMANCE OBJECTIVE

P12.5 Given a sectional chart with the route and data for a cross-country flight, complete with 75% accuracy the VFR flight plan with the data provided.

## CRITERION-REFERENCED MEASURE

C12.5 Completed flight plan, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use JS transparency 7190 to give an example of a properly completed flight plan.
2. Provide data from several cross-country flights, and have students practice completing the flight plans.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.6 Make VFR position report to Air Traffic Control (ATC).

## PERFORMANCE OBJECTIVE

P12.6 Given a sectional chart showing a five-leg route and an assigned altitude, broadcast with 75% accuracy five VFR position reports to ATC.

## CRITERION-REFERENCED MEASURE

C12.6 Simulated broadcast, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Have students pair up (one acting as pilot and the other as ATC) and practice making position reports to each other.

| CONCEPT/DUTY AREA | COURSE |
|---|---|
| 12. UNDERSTANDING THREE BASIC NAVIGATION METHODS | Aviation Pilot Training I (Semester II) |

## TASK/COMPETENCY

12.7 Explain how to navigate by using VOR, DME, and ADF.

## PERFORMANCE OBJECTIVE

P12.7 Given a sectional chart and while sitting at the GAT-1 simulator, identify a VOR, DME, and ADF facility on the chart and explain with 75% accuracy the procedure for tuning them into the cockpit navigational radios and how the instruments assist in navigation.

## CRITERION-REFERENCED MEASURE

C12.7 Demonstration, 75% accuracy

## ENABLING OBJECTIVES/LEARNING ACTIVITIES

1. Use FAA film *Using the Airspace--Navigation and Communication* to explain radio navigation procedures.
2. Use JS video *Radio Navigation Systems* to reinforce the FAA film.
3. Use JS transparencies 7146-7149 to discuss proper radio navigation procedures.
4. Have students use sectional charts to practice identifying radio navigation aids and plotting courses using the compass rose surrounding the VOR facilities.
5. Conclude navigation unit with the FAA video *VFR Tips for All Pilots*.

# RESOURCES

**TASK 12.1**

Equipment and Material: Sectional charts
Overhead projector

**TASK 12.2**

Equipment and Material: Sectional charts

**TASK 12.3**

Equipment and Material: Sectional charts
Plotter

Audiovisuals: *Dead Reckoning* (film). FAA.

**TASK 12.4**

Equipment and Material: Navigation logs

Audiovisuals: *Basic Navigation* (videotape). Jeppesen Sanderson.

**TASK 12.5**

Equipment and Material: Sectional charts

Audiovisuals: Transparency 7190. Jeppeson Sanderson.

**TASK 12.6**

Equipment and Material: Sectional charts

# FINAL ASSIGNMENT: FAA PRIVATE PILOT WRITTEN TEST

Students will complete Aviation Pilot Training I (Semesters I and II) by demonstrating the knowledge required to pass the FAA Private Pilot Written Test.

The instructor will distribute to students the FAA *Private Pilot Question Book* early in the year. The 50 questions used on any version of the test are found somewhere in the 800 questions in the *Question Book*. As subjects in the *Question Book* are covered during the course, the instructor will assign appropriate questions for student homework.

The instructor will administer all tests and quizzes from the *Private Pilot Question Book* at appropriate intervals throughout the year.

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